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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,059	12/04/2003	Schiavon Mauro	ESG004	7670

7590 02/16/2006
Thomas S. Baker, Jr.
1371 West 3rd Avenue
Columbus, OH 43212

EXAMINER

MAYEKAR, KISHOR

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,059

Applicant(s)

MAURO, SCHIAVON

Examiner

Kishor Mayekar

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-7 and 13-24 is/are pending in the application.
- 4a) Of the above claim(s) 6, 7, 15, 16, 18, 20, 22 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,2,4,5,13,14,17,19,21 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of invention of Group I, claims 1, 2, 4, 5, 13, 14, 17, 19, 21 and 23 in the reply filed on November 30, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

2. The abstract of the disclosure is objected to because it is not a single paragraph and because the phrase "are disclosed" in line 2. Correction is required. See MPEP § 608.01(b).

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is

important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The disclosure is objected to because of the following informalities:
- o the inclusion of claims in the specification in line 4 of page 7;
 - o the typo error in the phrase "rodss" in line 12 of page 7;
 - o the incorrect phrase "Always in Fig. 2 is" in line 9 of page 11;
 - o the typo error in the phrase "continuos" in line 22 of page 17; and
 - o the incorrect phrase "the this way" in line 14 of page 20.

Appropriate correction is required.

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

6. Claims 1, 2, 4, 5, 13, 14, 17, 19, 21 and 23 are objected to because of the following informalities:

- o in claim 1, the term "a" before the phrase "inlet port", "evacuation port" and "inert gas" needs to be changed to -an-- to be grammatically correct; and
- o in claims 2, 4, 5, 13, 14, 17, 19, 21 and 23, the phrase "characterized in that" is not conformed with standard U. S. practice. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1, 2, 4, 5, 13, 14, 17, 19, 21 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 or 2 recites that an inductor is supplied from a high frequency generator. However, by reading the specification, it appears that a high frequency generator powers an inductor around which a strong high frequency electromagnetic field is produced. The generator does not supply the inductor but powers.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1, 2, 4, 5 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the phrases "the axis", "the continuous heating", "the consequent vaporization", and "the head" lack antecedent basis. The phrase "afterward the

same" is confusing as which subject matter is afterward the same, the plasma or the graphite element.

In claim 2, the phrase "the first conductor" lacks antecedent basis.

In claim 4, the phrase "alternatively shaped" is confusing as to which subject matter is alternatively shaped, the graphite element or the rod.

In claim 5, the phrase "that injects" needs to be replaced with the phrase -- for injecting-- to eliminate reference to method of operating the device.

In claim 23, the phrase "is composed of" is equivalent to claim language "consisting of" which excludes any non-specified element. However the claim recites that the catalyst metal is composed of one or two or more of metal that is not consistent with the meaning of the phrase "is composed of". Also, the Markush is improperly recited. It should be in the format "metal selected from the group consisting of ..." (emphasis added).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been

obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 5, 13, 17, 19, 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loutfy et al. (US 2003/0082074 A1) in view of Withers et al. (US 5,876,684) and either Wong et al. (US 5,288,969) or Cheung et al. (US 6,517,913 B1). Loutfy's invention is directed to a RF plasma method for producing nanotubes and device thereof. Loutfy discloses in Fig. 1 that the device comprises an inductor powered by a high frequency generator surrounding a vacuum chamber with an inlet port and an evacuation port, wherein a powder feeder for feeding powder at the inlet port. Loutfy also disclose in paragraph [0035] that the powder comprises graphitized coal and/or graphite with metal catalyst. The differences between Loutfy and the above claims are the provision that the feeder is solid rod and the inductor is inside the vacuum chamber.

As to the former, Withers discloses a similar device for producing fullerene comprising an inductor powered by a high frequency generator surrounding a reactor with an inlet and outlet (Fig. 6), where the atmosphere condition is similar to those in Figs. 1, 2 and 3 (col. 7, lines 42-45) which is between 10^{-6} and 760 torr (col. 4, lines 63-66) and wherein the solid rod may be fed into the vacuum chamber

(col. 7, lines 31-34 and col. 7, line 67 through col. 8, line 3). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Loutfy's teachings as shown by Withers because the selection of any equivalent feeders to feed materials through an induction plasma would have been within the level of ordinary skill in the art.

As to the latter, Wong shows an inductively coupled RF plasma torch that a coil may be positioned internal or external of the chamber wall (paragraph crossing cols. 2 and 3). Cheung shows in an apparatus for converting perfluorocompound gases from semiconductor processing equipment a plasma cleaning apparatus comprising an inductively coupled plasma source with a coil placed either inside or outside a vacuum chamber (Fig. 11 and col. 22, lines 15-17). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Loutfy's teachings as shown by either Wong or Cheung the selection of any equivalent inductively coupled plasmas sources with coil placed inside or outside a vacuum chamber would have been within the level of ordinary skill in the art.

As to the subject matter of claim 17, Loutfy discloses in paragraph [0029] the use of pure graphite powder and in paragraph [0008] the use of high carbon

content in the coal for improving the yield.

13. Claims 2 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loutfy '094 in view of Withers '684 and either Wong '969 or Cheung '913 as applied to claims 1, 5, 13, 17, 19, 21 and 23 above, and further in view of Hansz (US 5,285,046). The difference between the references as applied above and the instant claim is the provision of a second inductor. Hansz shows the above limitation in apparatus for depositing particulate by inductive coupled plasma in addition to an apparatus with a single inductor (Fig. 2). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by Hansz because this would result a plasma with a uniform temperature.

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loutfy '094 in view of Withers '684 and either Wong '969 or Cheung '913 as applied to claims 1, 5, 13, 17, 19, 21 and 23 above, and further in view of Santilli (US 6,540,966 B1). The difference between the references as applied above and the instant claim is the provision that the graphite element is formed from more rods

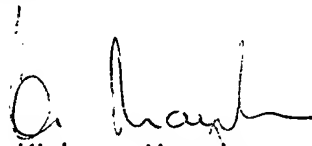
sin such a way to stack up and to support themselves. Santilli shows in an apparatus for recycling contaminated liquids by arc that the carbon rods are of the type recited (Fig. 2E). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by Santilli because this would result in automatically reloading the carbon rods.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR

only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kishor Mayekar
Primary Examiner
Art Unit 1753